

Claims

[1] A hollow particles-containing liquid composition which comprises:

(A) crosslinked hollow particles having particle  
5 diameters of 0.4  $\mu\text{m}$  or more and containing 40 mass % or more of a toluene insoluble, in an amount of 5 to 70 mass %,

(B) a reactive diluent (B1) and/or an organic solvent (B2) in an amount of 95 to 30 mass % [the total mass of the crosslinked hollow particles (A) and the reactive diluent  
10 (B1) and/or the organic solvent (B2) is 100 mass %], and

(C) a dispersing agent in an amount of 0 to 30 parts by mass relative to 100 parts by mass of the total of the crosslinked hollow particles (A) and the reactive diluent (B1) and/or the organic solvent (B2).

15 [2] A hollow particles-containing liquid composition according to Claim 1, which further comprises:

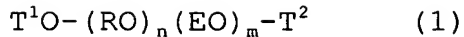
(D) a resin in an amount of 0.2 to 1,000 parts by mass relative to 100 parts by mass of the crosslinked hollow particles (A).

20 [3] A hollow particles-containing liquid composition according to Claim 2, wherein the resin (D) is at least one kind selected from the group consisting of thermosetting resins, thermoplastic resins and photo-setting resins.

[4] A hollow particles-containing liquid composition  
25 according to any of Claims 1 to 3, wherein the crosslinked hollow particles (A) have outer diameters of 0.4 to 5  $\mu\text{m}$ .

[5] A hollow particles-containing liquid composition according to any of Claims 1 to 4, wherein the dispersing agent (C) is a compound represented by the following formula

30 (1):



(T<sup>1</sup> is a hydrogen atom, an alkyl group of 1 to 18 carbon atoms or an alkenyl group of 2 to 18 carbon atoms; T<sup>2</sup> is a hydrogen atom, a sulfonic acid (sulfonic acid salt) group, a carboxylic acid (carboxylic acid salt) group, a phosphoric acid (phosphoric acid salt) group, an amino group or an ammonium group; RO is an oxyalkylene group of 3 to 18 carbon atoms; EO is an oxyethylene group; n is an integer of 1 to 50; m is an integer of 0 to 200; n RO groups are the same kind or different plural kinds; and n RO groups and m EO groups are bonded to each other by block bonding or random bonding).

[6] A hollow particles-containing liquid composition according to any of Claims 1 to 5, wherein the organic solvent (B2) is at least one kind selected from the group consisting of water-soluble amines, water-soluble glycol ethers, water-soluble ketones and water-soluble esters.

[7] A hollow particles-containing liquid composition according to any of Claims 1 to 6, which gives a haze of 30% or more when made into a dried film having a thickness of 30 μm.

[8] A process for producing an aqueous dispersion of crosslinked hollow polymer particles, which comprises:

a step of emulsion-polymerizing, in an aqueous medium, a first polymerizing monomer (a) composed of 5 to 80 mass % of an unsaturated carboxylic acid (a-1) and 20 to 95 mass % of other radical-polymerizing monomer (a-2) copolymerizable with the unsaturated carboxylic acid (a-1) [the total of the unsaturated carboxylic acid (a-1) and the other radical-polymerizing monomer (a-2) is 100 mass %] to obtain a

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dispersion of first polymer particles (i),

a step of emulsion-polymerizing, in an aqueous medium in the presence of 5 to 1,000 parts by mass of the first polymer particles (i), a second polymerizing monomer (b) composed of 10 to 80 mass % of a crosslinkable radical-polymerizing monomer (b-1), 0 to 20 mass % of an unsaturated carboxylic acid (b-2) and 0 to 90 mass % of other radical-polymerizing monomer (b-3) copolymerizable with the crosslinkable radical-polymerizing monomer (b-1) [the total of the crosslinkable radical-polymerizing monomer (b-1), the unsaturated carboxylic acid (b-2) and the other radical-polymerizing monomer (b-3) is 100 mass %] to obtain a dispersion of core-shell polymer particles (ii) wherein each surface layer of the first polymer particles (i) is covered with a shell layer containing a second polymer derived from the second polymerizing monomer (b) and the unreacted second polymerizing monomer (b), and

a step of adjusting the pH of the dispersion of the core-shell polymer particles (ii) with a volatile base to 7 or more to neutralize and swell the core-shell polymer particles (ii) and then polymerizing the unreacted second polymerizing monomer (b) to obtain an aqueous dispersion (iii) of crosslinked hollow polymer particles.

[9] A process for producing a hollow particles-containing liquid composition, which comprises:

a step of emulsion-polymerizing, in an aqueous medium, a first polymerizing monomer (a) composed of 5 to 80 mass % of an unsaturated carboxylic acid (a-1) and 20 to 95 mass % of other radical-polymerizing monomer (a-2) copolymerizable with the unsaturated carboxylic acid (a-1) [the total of the

unsaturated carboxylic acid (a-1) and the other radical-polymerizing monomer (a-2) is 100 mass %] to obtain a dispersion of first polymer particles (i),

5 a step of emulsion-polymerizing, in an aqueous medium in the presence of 5 to 1,000 parts by mass of the first polymer particles (i), a second polymerizing monomer (b) composed of 10 to 80 mass % of a crosslinkable radical-polymerizing monomer (b-1), 0 to 20 mass % of an unsaturated carboxylic acid (b-2) and 0 to 90 mass % of other radical-  
10 polymerizing monomer (b-3) copolymerizable with the crosslinkable radical-polymerizing monomer (b-1) [the total of the crosslinkable radical-polymerizing monomer (b-1), the unsaturated carboxylic acid (b-2) and the other radical-polymerizing monomer (b-3) is 100 mass %] to obtain a  
15 dispersion of core-shell polymer particles (ii) wherein each surface layer of the first polymer particles (i) is covered with a shell layer containing a second polymer derived from the second polymerizing monomer (b) and the unreacted second polymerizing monomer (b),

20 a step of adjusting the pH of the dispersion of the core-shell polymer particles (ii) with a volatile base to 7 or more to neutralize and swell the core-shell polymer particles (ii) and then polymerizing the unreacted second polymerizing monomer (b) to obtain an aqueous dispersion  
25 (iii) of crosslinked hollow polymer particles, and

a step of drying the aqueous dispersion (iii) of crosslinked hollow polymer particles and re-dispersing the dried material in a reactive diluent (B1-1) and/or an organic solvent (B2-1) to obtain a hollow particles-containing liquid  
30 composition.

[10] A process for producing a hollow particles-containing liquid composition, which comprises:

a step of emulsion-polymerizing, in an aqueous medium, a first polymerizing monomer (a) composed of 5 to 80 mass % of an unsaturated carboxylic acid (a-1) and 20 95 mass % of other radical-polymerizing monomer (a-2) copolymerizable with the unsaturated carboxylic acid (a-1) [the total of the unsaturated carboxylic acid (a-1) and the other radical-polymerizing monomer (a-2) is 100 mass %] to obtain a  
10 dispersion of first polymer particles (i),

a step of emulsion-polymerizing, in an aqueous medium in the presence of 5 to 1,000 parts by mass of the first polymer particles (i), a second polymerizing monomer (b) composed of 10 to 80 mass % of a crosslinkable radical-  
15 polymerizing monomer (b-1), 0 to 20 mass % of an unsaturated carboxylic acid (b-2) and 0 to 90 mass % of other radical-polymerizing monomer (b-3) copolymerizable with the crosslinkable radical-polymerizing monomer (b-1) [the total of the crosslinkable radical-polymerizing monomer (b-1), the  
20 unsaturated carboxylic acid (b-2) and the other radical-polymerizing monomer (b-3) is 100 mass %] to obtain a dispersion of core-shell polymer particles (ii) wherein each surface layer of the first polymer particles (i) is covered with a shell layer containing a second polymer derived from  
25 the second polymerizing monomer (b) and the unreacted second polymerizing monomer (b),

a step of adjusting the pH of the dispersion of the core-shell polymer particles (ii) with a volatile base to 7 or more to neutralize and swell the core-shell polymer  
30 particles (ii) and then polymerizing the unreacted second

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polymerizing monomer (b) to obtain an aqueous dispersion  
(iii) of crosslinked hollow polymer particles, and

a step of adding, to the aqueous dispersion (iii) of  
crosslinked hollow polymer particles, a reactive diluent (B1-  
5 1) and/or an organic solvent (B2-1) and then removing water  
to obtain a hollow particles-containing liquid composition.

[11] An optical article comprising a transparent substrate  
and a dried film of a hollow particles-containing liquid  
composition set forth in any of Claims 1 to 7, formed on the  
10 surface of the transparent substrate.

[12] An optical article according to Claim 11, wherein the  
transparent substrate is at least one kind selected from the  
group consisting of glass, polyethylene terephthalate resin,  
polycarbonate resin, acrylic resin, triacetyl cellulose resin  
15 and norbornene-based resin.